Dependable Hydro Capacity Summer 2008 Electricity Supply and Demand Outlook Workshop

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Hydro Capacity Ratings Are Based on Summer Reliability Needs or Performance

- "A hydro resource must be able to operate during 4 super-peak hours for 3 consecutive days for capacity in that month to count." – *CEC supply form instructions January 2007*
- QF hydro Qualifying Capacity "will be determined based on historic performance during the Standard Offer 1 peak hours of noon to 6:00 p.m., using a three-year rolling average." – *MRTU tariff 40.13.3*

Hydro Capacity in CAISO

LSEs in the CAISO Balancing Authority Area (BAA)	30+ MW	< 30 MW	All 1-in-2 Utility-owned	Dry Year Derate	QF Hydro 1-in-2	Con-tracts 1-in-2	Total
PG&E	4,370	246	4,616	conf.	61	0	
DWR - SWP (on peak)	1,565	32	1,597	530			
SCE	996	92	1,088	0	17	23	
CCSF - Hetch Hetchy	297		297			0	
Silicon Valley Power	227	24	251	75		0	
NCPA	128	2	130				
12 other LSEs with hydro	103	15	96		1	22	
CAISO area totals	7,686	411	8,075	605	79	45	7,594

Dependable Hydro Capacity in CAISO is Based on the Dry Year

- "Qualifying Capacity … will be determined based on net dependable capacity defined by NERC GADS minus variable head de-rate based on average dry year reservoir level."
- "Average dry year reflects a one-in-five dry hydro scenario (for example, using the 4th driest year from the last 20 years on record." – *MRTU tariff 40.13.3*

CAISO retains some discretion over LSE-owned & controlled hydro

- SCs shall provide "a proposed annual use plan for each Use-Limited Resource"
- CAISO can discuss proposed annual use plans "and suggest potential revisions to meet reliability needs of the system."
- "Hydroelectric Generating Units and Pumping Load will be able to update use plans intra-monthly as necessary to reflect hydrological and meteorological conditions." – *MRTU tariff 40.6.4.2*
- Gen units & Pumping Load will not be subject to Residual Unit Commitment process – *tariff 40.6.4.3.2*

Hydro Capacity in SMUD / Western

LSEs in the SMUD Balancing Authority Area (BAA)	30+ MW	< 30 MW	All 1-in-2 Utility-owned	Dry Year Derate	QF Hydro 1-in-2	Con-tracts 1-in-2	Total
SMUD	649	35	684	0		438	
Roseville	82	0	82	3		0	
Modesto ID	62	0	62	7		0	
Redding	0	2	2	0		99	
Shasta Lake	0	0	0			11	
Western: end-use loads	137		137			0	
SMUD BAA totals	930	37	967	10	0	548	1,505

Hydro Capacity in LADWP

LSEs in the LADWP Balancing Authority Area	30+ MW	> 30 MW	All 1-in-2 Utility-owned	Dry Year Derate	QF Hydro 1-in-2	Con-tracts 1-in-2	Total
LADWP	1,720	211	1,931			0	
Burbank	20	0	20	0		0	
Glendale	20	0	20	0		0	
LADWP BAA totals	1,760	211	1,971	0	0	0	1,971

Dependable Hydro Capacity Statewide in August 2008

"Statewide" Summary of 5 Balancing Authority Areas	30+ MW	< 30 MW	All 1-in-2 Utility-owned	Dry Year Derate	QF Hydro 1-in-2	Con-tracts 1-in-2	Total
CAISO	7,686	411	8,075	605	79	45	7,594
SMUD - Western	930	37	967	10	0	548	1,505
LADWP	1,760	211	1,971	0	0	0	1,971
Imperial ID	33	32	65	0	0	0	65
Turlock ID	134	12	146	11	0	27	162
Statewide Totals	10,543	703	10,708	626	68	620	11,297

How Would a Severe Drought Affect Hydro Capacity?

Additional Derates for Hydro Capacity

From a 1-in-5 Dry Year to a **1-in-10 Critically Dry Year**

LSE	**MW Derate**
SCE	50
SVP	74
TID	11
Roseville	5
Total	**140 MW**

Data from 2005 *IEPR* LSE supply plan filings (*did not include DWR or Western*)

Hydro Capacity Does not Derate in Proportion to Annual or Monthly Snowpack or Runoff

- Most utility-owned hydro capacity uses high-head penstock infrastructure not subject to gross head derates caused by low reservoirs
- Most utility-managed reservoirs are kept full to meet daily, weekly, and annual peak loads
- Low elevation PHs at multipurpose reservoirs will derate in late summer and are transparent